1. (Amended) A method for detecting motion at a temporal intermediate position between previous and next images, in which a criterion function for candidate vectors is optimized, said function depending on data from both previous and next images and in which the optimizing is carried out at the temporal intermediate position in non-covering and non-uncovering areas, characterized in that the optimizing is carried out at the temporal position of the next image in covering areas and at the temporal position of the previous image in uncovering areas.

2. (Amended) The method as claimed in claim 1, wherein the previous image is shifted over a fraction α times the candidate vector, the next image is shifted over $1 - \alpha$ times the candidate vector and the fraction α may change within the image period.

3. (Amended) The method as claimed in claim 1, wherein the criterion function is a match error which is minimized.

4. (Amended) The method as claimed in claim 2, wherein the fraction α is controlled by a covering/uncovering detector in the matching process.

5. (Amended) The method as claimed in claim 4, wherein the fraction α is set to 1 in case of covering and set to 0 in case of uncovering.

6. (Amended) The method as claimed in claim 4, wherein the covering/uncovering detector decides on data in a previous image to the fraction α in the current estimation.

7. (Amended) The method as claimed in claim 1, wherein a velocity edge X_E is determined, an occlusion area is marked around said edge, and in said occlusion area, foreground velocity is replaced by background velocity or reversibly dependent on whether the occlusion area is a covering or uncovering area, the sign of the foreground velocity and on which side of the velocity edge X_E the foreground is.

8. (Amended) The method as claimed in claim 7, wherein at the position $\vec{x}_1$ of a velocity edge

- a first position $\vec{x}_a$ in the previous (covering) or next (uncovering) image is calculated by shifting $\vec{x}_1$ over the first vector at one side of the edge

- a second position $\vec{x}_b$ in the previous (covering) or next (uncovering) image is calculated by shifting $\vec{x}_1$ over the second vector at the other side of the edge
- and a third intermediate position between $\vec{x}_a$ and $\vec{x}_b$ is calculated
- while finally, the vector fetched with $v_{\vec{av}}$ at the third position in the previous (covering) or next (uncovering) image is filled in those regions of the image in the environment of the edge, to which no vector is projected, in case the background vector $v_{\vec{BG}}$ should be filled in, and the vector chosen between $\vec{D}(\vec{x}-\begin{pmatrix}1\\0\end{pmatrix},n)$ and $\vec{D}(\vec{x}+\begin{pmatrix}1\\0\end{pmatrix},n)$ which is most different from $v_{\vec{av}}$ is filled in, in case a foreground vector $v_{\vec{FG}}$ should be filled in.

9. (Amended) The method as claimed in claim 8, wherein the intermediate position is $(\vec{x}_a + \vec{x}_b)/2$.

10. (Amended) The method as claimed in claim 7, wherein a background velocity is identified as a velocity which crosses the velocity discontinuity and projects to a foreground velocity in the previous picture, whereas a foreground velocity projects to itself.

11. (Amended) The method as claimed in claim 7, wherein near edges it is tested whether the mentioned edge has moved over the first vector on one side of the edge, or over the second vector on the other side of the edge, in case the edge moves with the first (second) vector, the second (first) vector is filled in those regions of the projected vector field in the environment of the edge, to which no vector is projected, in case a background vector $v_{\bar{B}G}$ should be filled in, and the other vector is filled in, in case a foreground vector $v_{\bar{F}G}$ should be filled.

12. (Amended) The method as claimed in claim 10, wherein the crossing from a background region to a foreground region in the previous image is verified by the match error of the vector in that block.

13. (Amended) An apparatus for detecting motion at a temporal intermediate position between previous and next images, comprising means for optimizing a criterion function for candidate vectors, said function depending on data from both previous and next images in which the optimizing is carried out at the temporal intermediate position in non-covering and non-uncovering areas, characterized in that said apparatus further comprises means for detecting covering or uncovering areas, wherein the optimizing is carried out at the

temporal position of the next image in covering areas and at the temporal position of the previous image in uncovering areas.

14. (Amended) The apparatus as claimed in claim 13, wherein the previous image is shifted over a fraction α times the candidate vector, the next image is shifted over $1 - \alpha$ times the candidate vector and the fraction α may change within the image period.

15. (Amended) The apparatus as claimed in claim 13, wherein the criterion function is a match error which is minimized.

16. (Amended) The apparatus as claimed in claim 14, wherein said apparatus further comprises a covering/uncovering detector for controlling the fraction α in the matching process.

17. (Amended) The apparatus as claimed in claim 16, wherein the fraction α is set to 1 in case of covering and set to 0 in case of uncovering.

18. (Amended) The apparatus as claimed in claim 16, wherein the covering/uncovering detector decides on data in a previous image to the fraction α in the current estimation.

19. (Amended) The apparatus as claimed in claim 13, wherein a velocity edge X_E is determined, an occlusion area is marked around said edge, and in said occlusion area, foreground velocity is replaced by background velocity or reversibly dependent on whether the occlusion area is a covering or uncovering area, the sign of the foreground velocity and on which side of the velocity edge X_E the foreground is.

20. (Amended) The apparatus as claimed in claim 19, wherein said apparatus further comprises calculation means for, at the position $\vec{x}_1$ of a velocity edge, calculating

- a first position $\vec{x}_a$ in the previous (covering) or next (uncovering) image by shifting $\vec{x}_1$ over the first vector at one side of the edge
- a second position $\vec{x}_b$ in the previous (covering) or next (uncovering) image by shifting $\vec{x}_1$ over the second vector at the other side of the edge
- and a third intermediate position between $\vec{x}_a$ and $\vec{x}_b$,
- while finally, the vector fetched with $v_{\bar{a}v}$ at the third position in the previous (covering) or next (uncovering) image (9) is filled in those regions of the image in the environment of the edge, to which no vector is projected, in case the background vector $v_{\bar{B}G}$

should be filled in, and the vector chosen between $\vec{D}(\vec{x}-\begin{pmatrix}1\\0\end{pmatrix},n)$ and $\vec{D}(\vec{x}+\begin{pmatrix}1\\0\end{pmatrix},n)$ which is most different from $v_{\vec{a}v}$ is filled in, in case a foreground vector $v_{\vec{F}G}$ should be filled in.

21. (Amended) The apparatus as claimed in claim 20, wherein the intermediate position is $(\vec{x}_a + \vec{x}_b)/2$.

22. (Amended) The apparatus as claimed in claim 19, wherein said apparatus further comprises means for projecting two positions on either side of the edge to the previous (covering) or next (uncovering) image, in which a background velocity is identified as a velocity which crosses the velocity discontinuity and projects to a foreground velocity in the previous picture, whereas a foreground velocity projects to itself.

23. (Amended) The apparatus as claimed in claim 19, wherein said apparatus further comprises means for testing near edges whether the mentioned edge has moved over the first vector on one side of the edge, or over the second vector on the other side of the edge, in case the edge moves with the first (second) vector, the second (first) vector is filled in those regions of the projected vector field in the environment of the edge, to which no

vector is projected, in case a background vector $v_{\bar{B}G}$ should be filled in, and the other vector is filled in, in case a foreground vector $v_{\bar{F}G}$ should be filled.

24. (Amended) The apparatus as claimed in claim 22, wherein said apparatus further comprises verification means for verifying the crossing from a background region to a foreground region in the previous image by the match error of the vector in that block.

25. (Amended) An image display apparatus comprising apparatus for detecting a motion vector as claimed in claim 13, means for interpolating image parts connected to said detecting apparatus, and a display device connected to the interpolating means.